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IS 14498 (1998): Dimensions of EP cores made of magnetic oxides and associated parts [LITD 5: Semiconductor and Other Electronic Components and Devices]

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Indian Standard

EP-CORES MADE OF MAGNETIC OXIDES AND ASSOCIATED PARTS — DIMENSIONS

ICS 29.180; 29.040.10

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1998

Price Group 2

Magnetic Components and Ferrite Materials Sectional Committee, LTD 13

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Magnetic Components and Ferrite Materials Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

The objective of this Indian Standard is to standardize the dimensions of a preferred range of EP-cores made of magnetic oxides, the dimensional limit of coil formers to be used with these cores and the location of their pins, for the purpose of mechanical interchangeability.

This standard is largely based on IEC Pub 1596 (1995) 'Magnetic oxide EP-cores and associated parts for use in inductors and transformers — Dimensions', issued by the International Electrotechnical Commission.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

EP-CORES MADE OF MAGNETIC OXIDES AND ASSOCIATED PARTS — DIMENSIONS

1 SCOPE

1.1 This standard specifies the dimensions that are of importance for mechanical interchangeability for a preferred range of EP- cores made of magnetic oxides, the dimensional limits for coil formers to be used with these cores and the locations of their terminal pins on a 2.50 mm printed wiring grid in relation to the base outlines of the cores.

NOTE— The general consideration upon which the design of this range of cores is based are given in Annex A.

1.2 It also specifies the main dimensions of coil formers to be used for EP-cores.

2 REFERENCE

2.1 The Indian Standard listed below is a necessary adjunct to this standard:

IS No.	*Title*
1885 (Part 31) : 1971	Electrotechnical vocabulary : Part 31 Magnetism

3 PRIMARY STANDARD

3.0 Compliance with the following requirements ensures mechanical interchangeability of complete assemblies and coil formers.

3.1 Pin Location and Base Outlines

These shall be as shown in Fig. 1, in which the base is viewed from the pin side, that is, from the underside of the printed wiring boards.

The pin shall fit into holes according to 2.50 mm grid system, the nominal hole diameter being:

a) 1 mm when the shortest distance between pins is 2.50 mm, and

b) 1.3 mm when the shortest distance between pins is 5.00 mm or more.

3.2 Effective Parameter Values

The effective parameter values for cores having the dimensions given in Table 1 shall be as shown in Table 2.

4 DERIVED STANDARDS

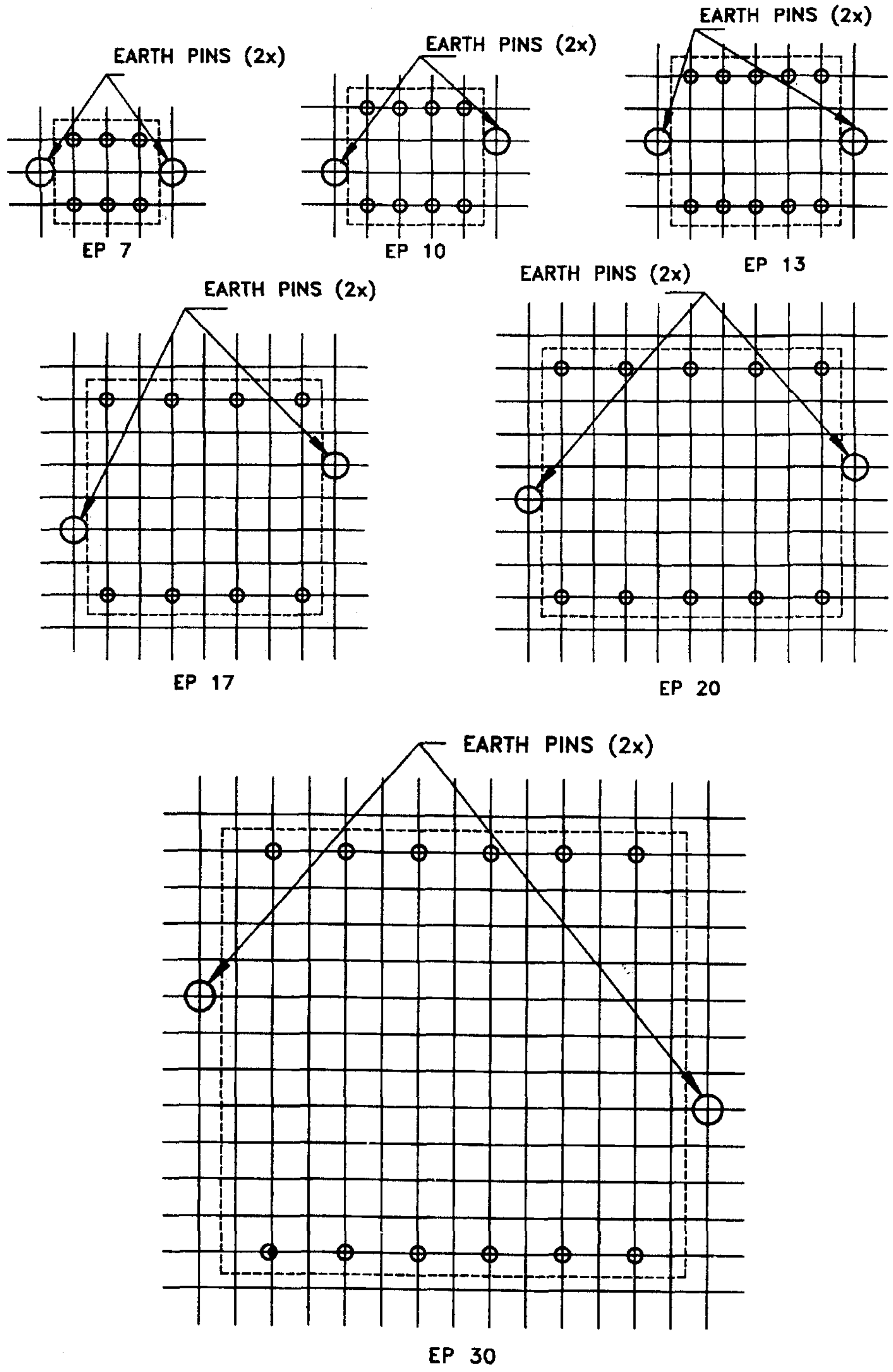
4.1 Parties interested in making or using EP-cores may find it desirable to lay down local standards for everyday use. These may show the dimensions in greater detail than 3, and may correspond to the state of the art in that area. When doing so, care should be taken not to exclude any other type of EP-core which meets the Indian primary standard and which also meets the requirements of the user.

When a departmental standard is prepared, the relevant departmental standardization body is strongly requested to insert a note stating that:

a) the standard is in accordance with the dimensional standard of this present publication but that more details are given in order to promote the practical use of the standard,

b) other solutions are possible within the framework of this Indian Standard and should not be excluded if such cores and coil formers are functionally interchangeable with those according to the national standard.

By way of example, a possible standard for coil formers is given in Annex B.

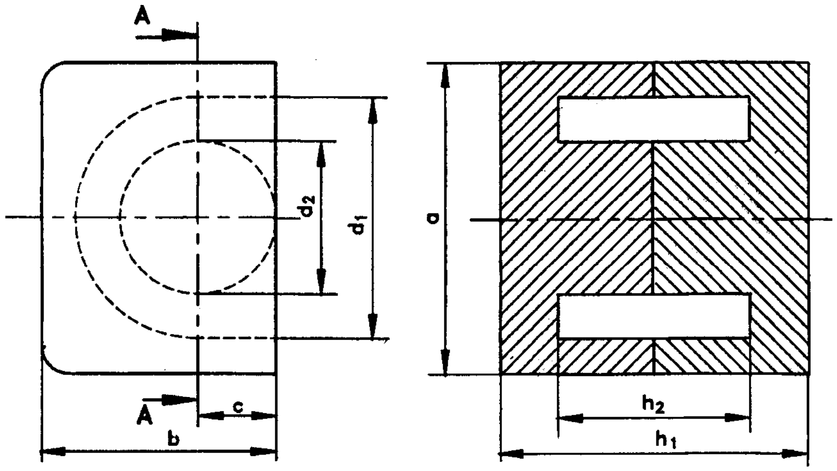


NOTE — 2.50 mm grids.

FIG. 1 PIN LOCATIONS AND BASE OUTLINES VIEWED FROM THE UNDERSIDE OF THE BOARD

Table 1 Dimensions of EP Cores

(*Clause* 3.2)



SECTION A-A

Size	Unit	*a*		*b*		*c*	d_1		d_2		h_1		h_2	
		Min	*Max*	*Min*	*Max*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*
EP7	mm	9.00	9.40	6.20	6.50	1.80	7.20	7.60	3.20	3.40	7.30	7.50	5.0 0	5.40
EP10	mm	11.2	11.8	7.45	7.85	1.95	9.20	9.60	3.15	3.45	10.0	10.4	7.20	7.60
EP13	mm	12.2	12.8	8.60	9.00	2.50	9.70	10.3	4.20	4.50	12.7	13.0	9.00	9.40
EP17	mm	17.6	18.4	10.75	11.25	3.45	11.6	12.4	5.50	5.85	16.6	17.0	11.0	11.6
EP20	mm	23.5	24.5	14.6	15.3	4.70	16.1	16.9	8.50	9.00	21.2	21.6	14.0	14.6
EP30	mm	30.5	31.5	22.6	23.6	7.85	23.6	24.4	14.5	15.0	29.7	30.0	23.0	23.8

Table 2 Effective Parameter Values

(*Clause* 3.2)

	Effective Parameter				
Core Size	Core Factor	Core Factor	Effective Cross Section Area	Effective Magnetic Length	Effective Volume
	C_1 (mm^{-1})	C_2 (mm^{-3})	A_e(mm^2)	l_e(mm)	V_e(mm^3)
(1)	(2)	(3)	(4)	(5)	(6)
EP7	1.52	0.147	10.3	15.7	163
EP10	1.70	0.150	11.3	19.3	218
EP13	1.24	0.063 3	19.6	24.3	476
EP17	0.840	0.024 8	33.9	28.5	964
EP20	0.508	0.006 49	78.3	39.8	3 112
EP30	0.351	0.001 96	179	62.9	11 257

ANNEX A

(*Clause* 1.1)

EP-CORE DESIGN

A-1 GENERAL

A-1.1 The design of EP-cores standardized by this standard is based on the following conditions:

a) EP-cores are especially suited for use on printed wiring boards, because it is possible to solder the wire leads of the coils directly to the pin terminals inserted into the coil former. Normally, these pins should remain within the outline of the core base;

b) EP-cores are primarily used for inductors and transformers, but they can also be used for broad-band transformers and switched mode power supply applications; and

c) The base areas are square and the winding space is annular.

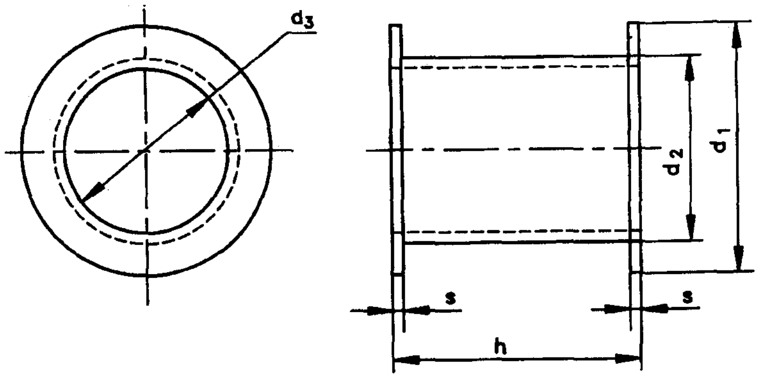
A-2 PIN LOCATION AND BASE OUTLINES

A-2.1 In order to provide for the largest possible number of pins, a shortest distance between pin centres of 2.50 mm shall be chosen. This can be safely handled by soldering techniques for miniature printed wiring. It leads to a maximum of 6 pins on smallest cores (for example, base dimensions 7.5 mm × 9.5 mm) and up to 12 pins for a largest core (base dimensions 32 mm × 31 mm).

ANNEX B

(*Clause* 4.1)

EXAMPLE OF A STANDARD FOR THE MAIN DIMENSIONS OF COIL FORMERS FOR EP-CORES MEETING THE INDIAN PRIMARY STANDARD



Size	*Unit*	d_1		d_2		d_3		*h*		*s*	
		Min	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*
EP7	mm	6.70	7.00	4.30	4.70	3.60	3.80	4.45	4.75	0.60	0.80
EP10	mm	8.60	9.00	4.65	4.95	3.60	3.80	6.70	7.00	0.50	0.70
EP13	mm	9.30	9.60	5.55	5.85	4.60	4.80	8.60	8.90	0.45	0.65
EP17	mm	11.1	11.4	7.05	7.35	6.00	6.30	10.6	10.9	0.55	0.75
EP20	mm	15.6	15.9	10.0	10.3	9.10	9.40	13.5	13.9	0.55	0.75
EP30	mm	23.1	23.5	16.7	17.0	15.1	15.4	22.5	22.9	0.80	1.00

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